

KEY TO THE GENERA OF NEW WORLD ALYDIDAE
(HEMIPTERA: HETEROPTERA)

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Abstract.—There are two subfamilies in Alydidae, Alydinae and Micrelytrinae, the latter with two tribes, Micrelytrini and Leptocorisini. The Alydinae contain two tribes, Daclerini (Old World genus *Daclera* Signoret only) and Alydini (the remainder of the subfamily). The Alydidae contain 53 genera, of which 19 occur in the New World exclusively, and two others in the Holarctic; a third is pantropical. The numbers break down as follows: Alydinae: Alydinae, 25 genera, 8 in the New World; Micrelytrinae: Micrelytrini, 22 genera, 11 in the New World; Micrelytrinae: Leptocorisini: Leptocorisidi, 4 genera, 1 in the New World; Noliphidi, 2 genera, 1 in the New World. Keys to subfamilies, tribes, genera, and subgenera of New World Alydidae are given.

Key Words: Hemiptera, Heteroptera, Alydidae, Micrelytrinae, Leptocorisini, New World, keys

Alydidae are a family of somewhat to greatly elongate heteropterans included with Stenocephalidae, Hyocephalidae, Rhopalidae, and Coreidae in the Coreoidea (Schaefer 1964, Henry 1997). Although Alydidae were once included as a subfamily of Coreidae, they are now treated as a separate family (Schaefer 1964). Three of the family's higher groups (based on *Alydus* Fabricius, *Micrelytra* Laporte, and *Leptocorisina* Latreille) have been variously treated as subfamilies and/or as tribes within several subfamilies; the three groups have always been considered distinct, but their taxonomic affinities and levels have been questioned.

The head and thorax of Alydidae are somewhat flattened, with no bumps or ridges (except the thoracic spines of some Micrelytrinae), and usually without troughs. The family's common sobriquet "broad-headed bugs" is best restricted to Alydinae, whose heads are indeed broader between

the eyes than are those of other coreoids. The heads of Alydinae and of many Micrelytrini are quite antlike, as would be those of other Micrelytrinae if their paraclypei were shorter than their clypei.

A recent analysis (Schaefer 1999) concludes that there are two subfamilies, Alydinae and Micrelytrinae, the latter with two tribes, Micrelytrini and Leptocorisini. Alydinae contains two tribes, Daclerini (Old World genus *Daclera* Signoret only) and Alydini (the remainder of the subfamily). Leptocorisini is divided into two subtribes, Leptocorisidi and Noliphidi; both occur in the New World (one genus each).

Characterizing the Alydinae is a feeding preference for legumes (Schaefer 1980, Schaefer and Mitchell 1983), a linear arrangement of the fifth-sternal trichobothria, spines on the hind femora, and the nymphs' excellent mimicry of ants, among other features. Micrelytrinae may have spines on the humeral angles of the pronotum as well

(sometimes) as on the scutellum's apex; these spines are occasionally broken off, but their bases remain. The fifth-sternal trichobothria of Micrelytrinae are grouped in a triangle. More genera of Micrelytrini than of Leptocorisini have humeral and scutellar spines, and members of one group of Micrelytrini mimic ants both as adults and as nymphs. (Note: The humeral angles of some Alydinae are acuminate and may be extended as spines; this occurs for example in many *Hyalymenus* Amyot and Serville; these spines are horizontal, not vertical like those of Micrelytrinae.) Leptocorisini are quite elongate grass-feeding bugs (some are serious pests of rice in the Old World) whose more advanced members have elongated paraclypei (juga) which pass anteriorly to the clypeus (tylus) and often meet in front of it.

Micrelytrini in some ways seem to be intermediate between Alydinae and Leptocorisini (I do not mean to suggest they are intermediate phylogenetically). The adults and nymphs of one group (the New World *Trachelium* Herrich-Schaeffer and some *Cydamus* Stål; the Old World *Dulichius* Stål) mimic ants, as do immature alydines; and some members of another group are nearly as elongate as Leptocorisini and probably also (*Protenor* Stål certainly) feed on Gramineae; at least one species of the antlike *Cydamus* also feeds on grasses (Forero and Schaefer, unpublished), as does *Esperanza texana* Barber (Wheeler and Henry 1984). In some nonantlike Micrelytrini the paraclypei surpass the clypeus, as they do in most Leptocorisini. And some Leptocorisini have thoracic spines, as do some Micrelytrini. These similarities among the three family groups occur both in the New World and in the Old World Alydidae. I discuss these differences and similarities, and their systematic significance, elsewhere (Schaefer 1972, 1999; and see 2003a).

It should be noted that Bliven (1973) created a new subfamily in Alydidae. His Araphinae Bliven 1973 was necessary, Bliven argued, because "along the one-way evo-

lutionary road, there was a successful commingling of genes between a *Tollius*-like form and a largid," the result of which were the genera *Araphe* Herrich Schaeffer 1850, *Japetus* Distant 1883 (now *Pararhapse* Henry [Henry 1988]), and *Jarhaphetus* Bliven 1956. (Note: The last two genera were synonymized with *Araphe* by Brailovsky [1981] with brief comment. More detailed reasons for the synonymy will be given by Schaefer and Ahmad [in preparation], in a revision of the New World Largidae.) These three genera (*Araphe*, *Pararhapse*, and *Jarhaphetus*) had been included in the Larginae, of the pyrrhocoroid family Largidae, until the genera, as a new subfamily, Araphinae, were moved by Bliven (1973) to Alydidae. As Froeschner (1988: 5) points out, Bliven's "changes, made with a minimum of discussion of critical and exact characters, have not been followed by other authors." The most important character, in Bliven's view, uniting these three genera with Alydidae (in Bliven's restricted definition: see below), is the possession in both of a forewing stridulitrum and corresponding hind-femoral plectrum. However, these occur in only a few genera of Alydinae (and not at all in Micrelytrinae), and also occur in other groups only very distantly related to Araphinae and Alydidae (Schaefer and Pupedis 1981). The three largid genera removed by Bliven (1973) to Alydidae are now part of the tribe Araphini (Largidae: Larginae) (see Schaefer 2000).

Bliven (1973) also removed to the Coreidae, without explanation, the alydid subfamilies (now tribes of a single subfamily, Micrelytrinae) Leptocorisinae and Micrelytrinae (s.s.). This action left Bliven's Alydidae with two subfamilies, Alydinae and Araphinae.

The Alydidae today contain 53 genera of which 19 occur in the New World exclusively; two others are Holarctic, and a third is pantropical:

- Alydinae: Alydini—25 genera, 8 in New World.

- Micrelytrinae: Micrelytrini—22 genera, 11 in New World.
- Micrelytrinae: Leptocorisini: Leptocorisidi—4 genera, 1 in New World.
- Micrelytrinae: Leptocorisini: Noliphidi—2 genera, 1 in New World.

The Alydinae comprise primarily Old World genera: One tribe (Daclerini, with just *Daclera*) occurs there only, six genera are exclusively New World, and two others (*Alydus* and *Megalotomus* Fieber) are Holarctic (Schaffner 1965). The New World genera seem to be mostly Neotropical: several genera are exclusively so, and a few others, although primarily Nearctic, have ranges extending into Mexico and (in one instance, *Stachyocnemus*, also into Cuba [Schaefer and Schaffner 1997]). The world genera, and some of the species, of Alydinae have been ably revised by Schaffner (1965), but the revision remains unpublished.

The Micrelytrinae: Micrelytrini badly need revision. My scant analysis comes from several published sources, but mostly from unpublished data of Imtiaz Ahmad. Of the 22 genera (two unpublished), 11 occur only in the New World; all 11 are Neotropical; of these 11, three occur also in the southwestern United States, and one (*Protenor*) occurs north from Central America throughout the United States and into central and eastern Canada (Brailovsky and Flores 1979, Froeschner 1988, Maw et al. 2000).

The Old World *Acestra* may represent a separate micrelytrine tribe (Ahmad, unpublished; Li and Zheng 1993). Of the six genera of Leptocorisini, one (the monotypic *Lymessus* Stål) is exclusively neotropical, and another (*Stenocoris* Burmeister) has 22 tropical species, only six of them in the New World (Ahmad 1965).

Thus, of the 53 alydid genera, only 19 occur exclusively in the New World, and only three (*Alydus*, *Megalotomus*, *Stenocoris*) have species in both the Old and the New Worlds (different species in most cas-

es). A thorough revision of both the New World and the Old World Micrelytrini will probably change these numbers somewhat (I suspect several genera should be synonymized). But the fact that Alydidae—as well as its subfamilies—are basically Old World, will remain evident. The north-south division will also remain clear: most genera, including those with the most species, are tropical, in both the New and Old Worlds, and have little extension north.

In this paper I am concerned only with New World alydids, especially with providing keys to encourage more work.

Interest in and collections of the family have increased recently, especially in the New World. There are separate surveys underway of the Alydidae (and other heteropterans) of French Guiana, Colombia, Nicaragua; and doubtless there are, or will be, others. The revisions of Schaffner (1965, Alydinae), Ahmad (1965, Leptocorisini), and to a more restricted degree that of Kormilev (1953, Micrelytrini of Argentina) provide a good basis for further work, although only parts of the first have been published. Because of this interest, and with this basis, I provide the following keys to the genera and subgenera of New World Alydidae.

Some of these keys are major modifications of existing ones and others are new. Some existing keys are too vague or too inaccurate or too regional to be useful; I have not used these, and I have checked those keys I did use against specimens (with indicated exceptions). I hope these keys stimulate further work on these fascinating bugs, and I hope that work includes even better keys.

KEY TO SUBFAMILIES AND TRIBES OF NEW WORLD ALYDIDAE

I have used several keys to these groups, and that by J. C. Schaffner (1965) is the best. Because that key remains unpublished, I present it here, slightly modified, with gratitude to its author (see also Schaefer 1999). A character in some published keys is the pres-

ence (*Leptocorisini*) or absence (*Micrelytrini*) of a rostrum-receiving groove on the thoracic sterna. However, at least in New World *Micrelytrinae*, genera of both tribes have the groove, although not always on all three sterna (Schaefer, unpublished).

- 1. Hind femur bearing spines (except in the Asian *Euthetus*); trichobothria of abdominal sternum five (= visible sternum three) arranged in a row lateral or anterior to spiracle (Fig. 1) Alydinae
- Hind femur without spines; trichobothria of abdominal sternum five arranged in a triangle posterior to spiracle. (Figs. 2, 3) *Micrelytrinae* 2
- 2. Second rostral segment shorter than third and fourth together; third rostral segment more than half as long as fourth; evaporative area of metathoracic scent gland smooth *Leptocorisini*
- Second rostral segment longer than third and fourth together; third rostral segment less than half as long as fourth; evaporative area ridged (may be very lightly ridged, as in *Calamocoris*) *Micrelytrini*

- Hind tibia straight, without apical spine 6
- 5. First antennal segment slightly longer than head; parameres of male directed towards one another, not projecting above ventral rim of genital capsule (Neotropical) *Hyalymenus* (*Hyalymenus* Stål)
- First antennal segment equal to or (more often) shorter than head; parameres directed dorsally and rising above capsule's ventral rim (Nearctic and Neotropical) *Hyalymenus* (*Tivarbus* Stål)
- 6. Without stridulatory device (stridulitrum on anterior edge of corium, plectrum near base of hind femur); posterolateral (humeral) angle of pronotum with small spine (Neotropical) *Neomegalotomus* Schaffner and Schaefer
- With stridulatory device (Fig. 4); without humeral spine 7
- 7. Distance between bases of ocellar tubercles equal to or greater than distance from base of ocellar tubercle to eye (Neotropical) *Burtinus* Stål
- Distance between ocellar bases less than distance from base to eye (Holarctic) 8
- 8. First antennal segment longer than second (Holarctic) *Megalotomus* Fieber
- First antennal segment shorter than second (Holarctic) *Alydus* Fabricius

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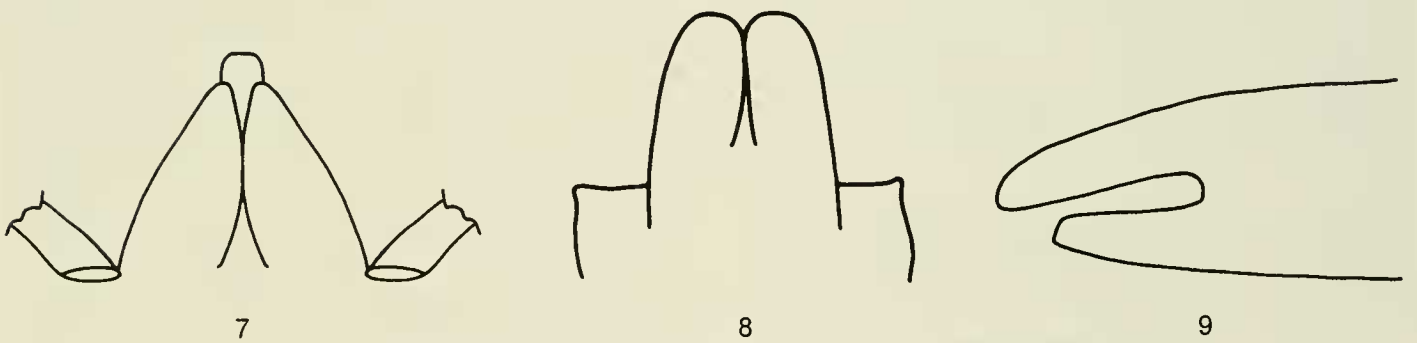
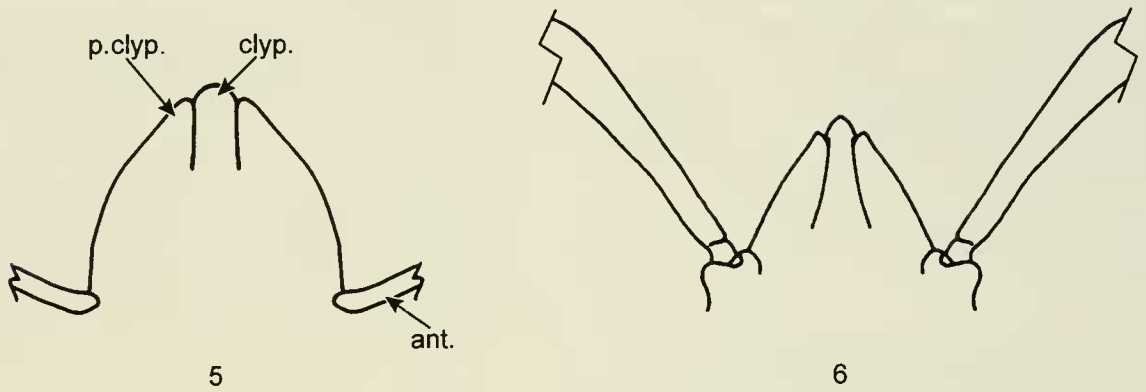
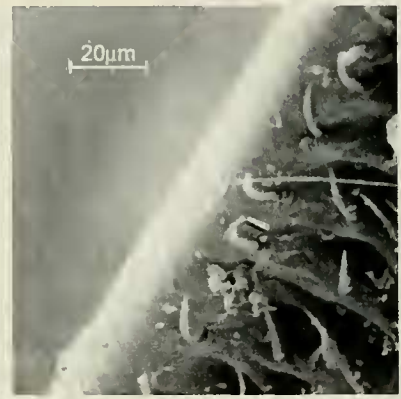
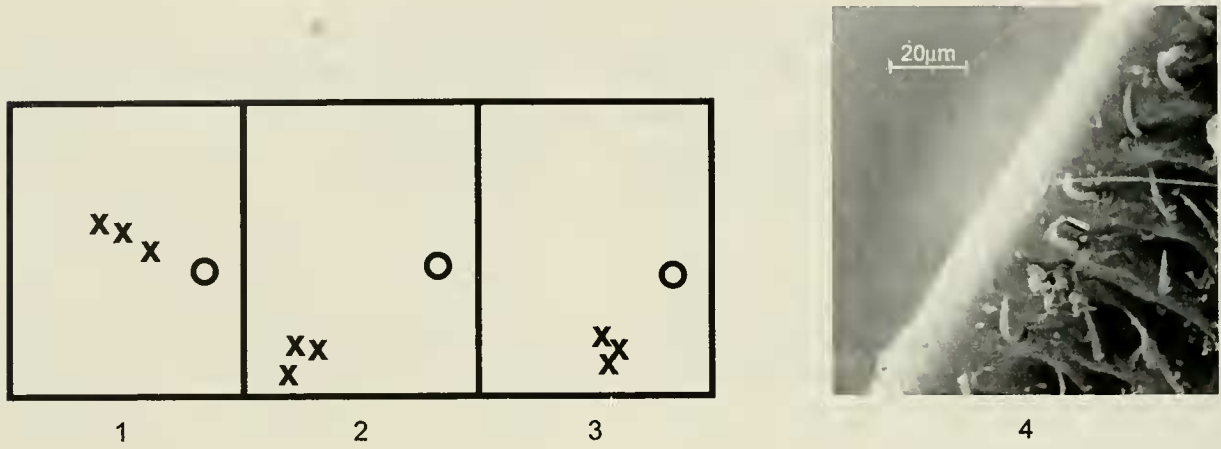
This key is based on those of Fracker (1918) and Schaffner (1965), and examination of specimens of *Alydus* (3 species), *Apidaurus* (2), *Burtinus* (2), *Hyalymenus* (4–5, both subgenera), *Megalotomus* (2), *Neomegalotomus* (2), *Stachyocnemus* (1), and *Tollius* (1); and on descriptions by Van Duzee (1906, 1921), Torre Bueno (1939, 1941), Brailovsky and Flores (1979), inter al.

- 1. Metathoracic scent gland opening reduced or not, peritreme absent or reduced 2
- Metathoracic scent gland apparatus (peritreme) well developed 4
- 2. Metathoracic scent gland peritreme absent; hind tibiae with two rows of prominent spines (Nearctic into Mexico and Cuba) *Stachyocnemus* Stål
- Metathoracic scent gland opening and peritreme reduced; without tibial spines 3
- 3. With stridulatory device (stridulitrum on anterior edge of corium [Fig. 4], plectrum near base of hind femur); clypeus (tylus) not extended beyond paraclypei (juga) (Fig. 5) (western United States into Mexico) *Tollius* Stål
- Without stridulatory device; clypeus extended (Fig. 6) (Neotropical) *Apidaurus* Stål
- 4. Hind tibia curved, with apical spine (*Hyalymenus* Stål) 5

Note.—*Darmistidus* Uhler (Uhler 1893), described from the island of St. Vincent in the Caribbean, is not included in this key. Uhler writes that the single included species, *D. maculatus* Uhler, is “[c]losely related to *Stachyocnemus*.” However, Torre Bueno (1941) synonymized *Darmistidus* with *Xenogenus*, without remarking that the latter is in a different family (Rhopalidae) and apparently without seeing specimens; this synonymy has since been confirmed by Göllner-Scheiding (1980, 1983), and discussed by me (Schaefer 2003b). Because *Darmistidus* is now in the Rhopalidae (as *Xenogenus*), I do not include it in this key.

KEY TO GENERA OF NEW WORLD MICRELYTRINAE: MICRELYTRINI

This key is based in part on those of Stål (1873), Fracker (1918), Torre-Bueno (1941), Kormilev (1953), and Brailovsky and Flores (1979), as well as on descriptions and discussions in Breddin (1901, 1903), Brailovsky (1991), and Schaefer (1996). Specimens of the following genera were studied: *Bac-*



Figs. 1-9. 1-3, Trichobothrial patterns of fifth abdominal sternum (lateral), diagrammatic; o = spiracle, x = trichobothrium. 1, Alydinae, *Burinus notatipennis* (Stål). 2, Micrellytrinae: Micrellytrini *Darmistus subvittatus* Stål. 3, Micrellytrinae: Leptocorisini, *Stenocoris* (*Stenocoris*) sp. 4, Stridulitrum on costal margin of forewing of *Tollius* sp. (modified from Schaefer and Pupedis 1981), best seen at high dissecting scope magnification. 5-8, Dorsal views of anterior of heads; ant. = antenna (cut off), clyp. = clypeus (tylus), p.clyp. = paraclypeus (juga). 5, *Tollius* sp. 6, *Apidaurus conspersus* Stål. 7, *Bactrodosoma parallelum* Stål. 8, *Darmistus subvittatus*. 9, Lateral view of head (anterior to antennae) of *Protenor belfragei* Haglund.

trodosoma (1 species), *Bactrophya* (1), *Calamocoris* (2), *Cydamus* (5), *Darmistus* (3), *Esperanza* (1), *Protenor* (2), and *Trachelium* (2). I have not seen specimens of *Eudarmistus*, *Bactrophyanixia*, or *Bactrocoris*, and have relied upon the descriptions by Breddin (1903), Brailovsky (1991), and Kormilev

(1953), respectively; and see discussion of *Eudarmistus* in Schaefer (2003a).

- 1. With spines on posterolateral (humeral, "shoulder") angles of pronotum and on tip of scutellum (some species ant-mimetic) 2
- With spines either on humeral angles or on scutellum (not both) 3

- Without spines on either humeral angles *or* scutellum 4
- 2. Metathoracic scent gland apparatus with auricle; head not elongated before eyes (distance from antennifers to apex of clypeus less than distance between eyes); head behind eyes tapering gently (Neotropical) *Cydamus* Stål
- Metathoracic scent gland apparatus without auricle; head elongated before eyes (distance from antennifers to apex of clypeus equal to distance between eyes); head behind eyes tapering sharply, narrowed (Neotropical) *Trachelium* Herrich-Schaeffer
- 3. Spine on scutellum only (Note: *Calamocoris* will key here in Froeschner's [1981] key, which errs in placing a spine on the scutellum.) (southern U.S., Mexico) *Esperanza* Barber
- Spine on each humeral angle only (Note: *Cydamus adspersipes* Stål [Brazil] will key out here. However, the first antennal segment of *Calamocoris* is longer than the head, whereas that of *Cydamus* [all species] is shorter.) (northern South America) *Calamocoris* Breddin
- 4. Tip of clypeus (tylus) not sharply deflected (Fig. 7) 5
- Tip of clypeus sharply deflected below tips of paraclypei (juga) (Fig. 8) 6
- 5. Small spur just medial to antennifers (Neotropical) *Bactrodosoma* Stål
- Without small spur (Neotropical) *Bactrophya* Breddin
- 6. Paraclypei in side view split (bifid) (Fig. 9) (Nearctic, Neotropical) *Protenor* Stål
- Paraclypei not split 7
- 7. Longer than 16 mm; paraclypei acuminate distally (Mexico) *Bactrophyanixia* Brailovsky
- Shorter than 14 mm; paraclypei rounded distally 8
- 8. Body greatly elongate (width/length $\times 100 = 10-13$) (Argentina) *Bactrocoris* Kormilev
- Body not greatly elongate (width/length $\times 100 = 22-27$) 9
- 9. Length 9–12 mm (southwestern U.S. into Central America) *Darmistus* Stål
- Length 15 mm (Bolivia) *Eudarmistus* Breddin
- Paraclypei meeting anterior to clypeus; pronotum somewhat flat (*Stenocoris* Burmeister) 2
- 2. Genital capsule of male with posterior angles pointed; posterior margin of female's seventh abdominal sternum with short medial split (southern U.S., throughout Neotropical) *Stenocoris* (*Oryzocoris* Ahmad)
- Genital capsule of male with posterior angles not sharply pointed; posterior margin of female's seventh abdominal sternum shallowly bilobed, without split (southern U.S., throughout Neotropics) *Stenocoris* (*Stenocoris* Burmeister)

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KEY TO GENERA AND SUBGENERA OF NEW WORLD MICRELYTRINAE: LEPTOCORISINI

This key is based partly on the key of Ahmad (1965) and on specimens of *Lymessus* (1 species) and *Stenocoris* (3 species, both subgenera).

- 1. Paraclypei (juga) shorter than clypeus (tylus), not meeting anterior to it; pronotum convex, sloping towards head (Cuba south into Paraguay and Brazil) *Lymessus geniculatus* (Guérin)

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